

U.S. Patent Application Serial No. 10/527,699

Amendment filed August 10, 2009

Reply to OA dated May 8, 2009

AMENDMENTS TO THE CLAIMS:

Please cancel claims 2, 3, 11, and 19 without prejudice or disclaimer, and amend claims 1, 4, 6, 12, 14-17 and 20, as follows. This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently amended): A catalyst composition comprising a crosslinked organic polymer compound and Pd(0) having no ligand, wherein said catalyst Pd(0) is physically carried on said crosslinked organic polymer compound, prepared by

homogenizing a straight chain organic polymer compound having a crosslinkable functional group, and a palladium catalyst in a solvent dissolving said straight chain organic polymer compound;

then depositing the composition formed; and

subjecting a crosslinkable functional group in said deposited composition to a crosslinking reaction,

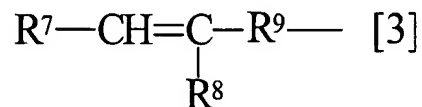
and wherein said straight chain organic polymer compound is obtained by polymerizing

1) a monomer having a crosslinkable functional group and a polymerizable double bond represented by:

(1) a glycidyl compound having an epoxy group as a crosslinkable functional group, selected from the group consisting of a glycidyl ether and a glycidyl ester represented by the following general formulas [1] and [2], respectively,

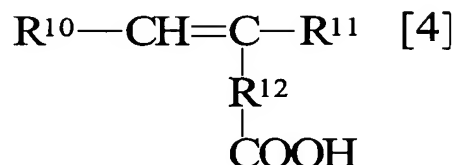


wherein R^2 , R^3 , R^5 and R^6 each independently represents a hydrogen atom or an alkyl group having 1 to 6 carbon atoms; X and Z each independently represents an alkylene group having 1 to 6 carbon atoms; R^2 may form a ring of 3 to 6 members together with carbon atoms of R^3 or X, and R^5 may form a ring of 3 to 6 members together with carbon atoms of R^6 or Z; and R^1 and R^4 each independently is a group represented by the following general formula [3]:



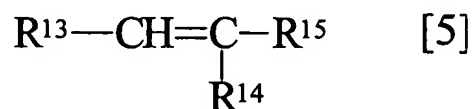
wherein R^7 and R^8 each independently represents a hydrogen atom or an alkyl group having 1 to 6 carbon atoms; R^9 represents a direct-linkage, an alkylene group having 1 to 6 carbon atoms, an arylene group having 6 to 9 carbon atoms, an arylalkylene group having 7 to 12 carbon atoms or an arylenealkylene group having 7 to 15 carbon atoms, wherein the aromatic ring in the arylene or arylenealkylene group may have an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms and/or a halogen atom, as a substituent;

(2) a monomer having a carboxyl group as a crosslinkable functional group, represented by the following general formula [4]:



wherein R^{10} represents a hydrogen atom or an alkyl group having 1 to 6 carbon atoms; R^{11} represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an aryl group having 6 to 10 carbon atoms or an aralkyl group having 7 to 12 carbon atoms, wherein the aromatic ring in the aryl group or aralkyl group may have an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms and/or a halogen atom as a substituent; and R^{12} represents a direct-linkage, an alkylene group having 1 to 6 carbon atoms, an arylene group having 6 to 9 carbon atoms, an arylalkylene group having 7 to 12 carbon atoms or an arylenealkylene group having 7 to 15 carbon atoms; or

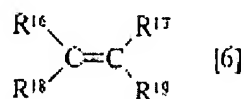
(3) a monomer having a hydroxyl group as a crosslinkable functional group, represented by the following general formula [5]:



wherein R^{13} represents a hydrogen atom or an alkyl group having 1 to 20 carbon atoms; R^{14} represents a hydroxyl group that may have a carbonyl group and/or an oxygen atom; R^{15} represents a

hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an aryl group having 6 to 10 carbon atoms or an aralkyl group having 7 to 12 carbon atoms; and an aromatic ring in the above aryl group or aralkyl group may have an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms and/or a halogen atom, as a substituent, and optionally

2) a monomer having a polymerizable double bond is represented by the general formula [6]:



wherein R^{16} and R^{17} each independently represent a hydrogen atom or an alkyl group having 1 to 6 carbon atoms; R^{19} represents a hydrogen atom, a halogen atom or an alkyl group having 1 to 6 carbon atoms; R^{18} represents a carboxyl group, a hydroxyl group, an acyloxy group having 2 to 6 carbon atoms, an arylacyloxy group having 7 to 15 carbon atoms, an alkoxycarbonyl group having 2 to 6 carbon atoms, an alkyl group having 1 to 6 carbon atoms, an aryl group having 6 to 10 carbon atoms and an aralkyl group having 7 to 12 carbon atoms; an aromatic ring in the above arylacyloxy group, aryl group and aralkyl group, may have further an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms or a halogen atom, as a substituent, and

wherein all of monomers having a crosslinkable functional group and a polymerizable double bond represented by the general formulas [1], [2], [4] and [5], and of monomers having a polymerizable double bond represented by the general formula [6], have an aromatic ring.

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Claims 2-3 (Canceled).

Claim 4 (Amended): The composition according to Claim 1, wherein the crosslinked organic polymer compound is:

~~a crosslinked product of a polymer or a copolymer obtained by polymerizing or copolymerizing 1) at least one monomer selected from (1) said glycidyl compound having an epoxy group, (2) said monomer having a carboxyl group, and (3) said monomer having a hydroxyl group or~~

a crosslinked product of a copolymer obtained by copolymerizing 1) at least one monomer having a crosslinkable functional group and a polymerizable double bond selected from the group consisting of (1) said glycidyl compound having an epoxy group, (2) said monomer having a carboxyl group, and (3) said monomer having a hydroxyl group, and 2) at least one monomer having a polymerizable double bond which is represented by the general formula [6].

Claim 5 (Previously presented): The composition according to Claim 4, wherein the crosslinked organic polymer compound is a crosslinked product of a copolymer obtained by copolymerizing :

- 1) two monomers having a crosslinkable functional group and a polymerizable double bond and
- 2) one monomer having a polymerizable double bond.

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Claim 6 (Currently amended): The composition according to Claim 4, wherein the crosslinkable functional group is an epoxy group, a carboxyl group, or a hydroxyl group ~~or an acyloxy group~~.

Claim 7 (Previously presented): The composition according to Claim 4, wherein ratio of a monomer unit derived from a monomer having a crosslinkable functional group and a polymerizable double bond is 0.1 to 100% based on all monomer units in the whole copolymer before crosslinking of the crosslinked organic polymer compound.

Claim 8 (Canceled).

Claim 9 (Previously presented): The composition according to Claim 4, wherein :
one monomer having a crosslinkable functional group and a polymerizable double bond is a glycidyl ether represented by the general formula [1]; and

the other monomer having a crosslinkable functional group is a monomer represented by the general formula [4] containing a carboxyl group, as a crosslinkable functional group, or a monomer represented by the general formula [5] containing a hydroxyl group as a crosslinkable functional group.

Claim 10 (Previously presented): The composition according to Claim 4, wherein at least one of the monomers having a crosslinkable functional group and a polymerizable double bond represented by

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the general formulas [1], [2], [4] and [5], and monomers having a polymerizable double bond represented by the general formula [6], has an aromatic ring.

Claim 11 (Canceled).

Claim 12 (Currently amended): The composition according to Claim 4, wherein in [[a]] (3) said monomer containing having a hydroxyl group as a crosslinkable functional group, represented by the general formula [5], R¹⁴ is a straight chain hydroxyalkyl group having 1 to 50 carbon numbers, which may contain an oxygen atom.

Claim 13 (Previously presented): The composition according to Claim 4, wherein ~~in~~ the crosslinked organic polymer compound has a crosslinked portion between an alkylene chain derived from a polymerizable double bond, and another alkylene chain derived from a polymerizable double bond, and the number of atoms in the shortest chain of said crosslinked portion is 1 to 400.

Claim 14 (Currently amended): The composition according to Claim 1, wherein the crosslinked organic polymer compound is that obtained by crosslinking a copolymer of:

- (I) a glycidyl compound having an epoxy group and a polymerizable double bond;
- (II) a styrene type monomer; and

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(III) an acrylic acid type monomer or a monomer containing a hydroxyalkyl group having at least one oxygen atom other than the oxygen atom of the hydroxyalkyl group and a polymerizable double bond.

Claim 15 (Currently amended): The composition according to Claim 14, wherein the monomer ~~[[of]] (III) in the crosslinked organic polymer compound has~~ is the monomer containing a hydroxyalkyl group containing at least one oxygen atom other than the oxygen atom of the hydroxyalkyl group and a polymerizable double bond.

Claim 16 (Currently amended): The composition according to Claim 14, wherein :

the glycidyl compound having an epoxy group and a polymerizable double bond is vinylbenzyl glycidyl ether or vinyl phenylglycidyl ether;

the styrene type monomer is styrene or methylstyrene;

the acrylic acid type monomer is an acrylic acid or a methacrylic acid; and

the monomer containing a hydroxyalkyl group having at least one oxygen atom other than the oxygen atom of the hydroxyalkyl group and a polymerizable double bond is tetraethylene glycol monomethacryloyl ester or tetraethylene glycol mono-2-phenyl-2-propenyl ether.

Claim 17 (Currently amended): A method for producing the composition according to Claim 1, comprising the steps of:

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homogenizing a straight chain organic polymer compound having a crosslinkable functional group, and a palladium catalyst ~~derived from Pd(0)~~ in a solvent which dissolves said straight chain organic polymer compound;

depositing the composition produced; and

subjecting a crosslinkable functional group in said deposited composition to a crosslinking reaction.

Claim 18 (Original): The method for production according to Claim 17, wherein the palladium catalyst is a complex with triphenylphosphine, tri-t-butylphosphine, triethylphosphine, or trimethylphosphine.

Claim 19 (Canceled).

Claim 20 (Currently amended): A method for performing an oxidization reaction of an alcohol, comprising the steps of:

reacting the composition according to Claim 1 with ~~[[an]]~~ a primary alcohol to form a ketone compound corresponding to the alcohol.